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AGRICULTURAL CHALLENGES AND THEIR IMPACT ON THE ECONOMY AND THE LIVES OF PEASANTS: EVIDENCE FROM RURAL INDIA

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ABSTRACT
Indian agriculture, the historic backbone of the rural economy, faces profound multidimensional challenges. Stagnating incomes, land fragmentation, market volatility, climate risks, technological gaps, and shifting youth aspirations have intensified distress among smallholders and peasant families. This paper combines primary field surveys (60farmers across 2 states), secondary datasets, and original data visualization to examine how land fragmentation, market volatility, climate shocks, and technological divides shape livelihoods, social stratification, and long-term mobility among peasants in rural India. The analysis highlights the interaction between economic constraints and social factors such as caste, gender, and youth aspirations, and proposes a set of integrated interventions around land, markets, infrastructure, and skills to support a more inclusive agrarian transformation.

RESEARCH OBJECTIVES
- To assess key agricultural challenges and their impact in Some of the rural villages in and around Telangana And Andhra Pradesh.
- To Analyze how these challenges affect income, productivity, social structure, and generational dynamics among peasants.
- To Provide actionable, evidence-based recommendations illustrated with data charts and comprehensive literature review.
- To Examine social dimensions including gender, caste, and generational aspirations in agrarian distress.

LITERATURE REVIEW
Agriculture dominates India's rural landscape—nearly 58% of the population depends on it directly or indirectly. Literature consistently maps four dominant themes Key themes from sources like NITI Aayog and World Bank highlight policy evolution (PMFBY, Digital Agriculture Mission), productivity stagnation (TFP trends), and sustainability needs (agroecology shift). Studies (e.g., Sharma & Mittal) link fragmentation to low mechanization; others (Cavazza et al.) advocate AI for business models. Gaps: Limited primary data on social dimensions and integrated reforms.

Theme	Key Sources	Contributions
Policy & Trends	Dr. V. Basil Hans; NITI Aayog	Reforms' impacts on subsidies, irrigation
Productivity	T. Mohapatra et al.; Ashok K. Sharma	TFP analysis, Green Revolution drivers
Sustainability	N.P. Bhardwaj; Alberto Cavazza	Debt, pollution, AI models

	Title/Focus	Key Authors	Theme/Contribution
1	**Agriculture and Public Policy in India – Recent Trends and Future Directions** (Research Article)	**Dr. V. Basil Hans**	Explores the evolution of agricultural policy in India, analyzing the impact of key reforms (like PMFBY, Digital Agriculture Mission) on rural livelihoods and addressing ongoing debates on subsidies, irrigation, and market access.
2	**A New Paradigm for Indian Agriculture: From Agroindustry to Agroecology** (Policy Paper)	**NITI Aayog** (Government think tank)	Reviews challenges, categorizing them into productivity-enhancing and sustainability issues. Argues for a paradigm shift toward agroecology to ensure both productivity and environmental sustainability.
3	**Indian Agriculture: Achievements and Aspirations** (Chapter in 'Indian Agriculture after Independence')	**T Mohapatra, PK Rout, H Pathak** (and others)	Provides a comprehensive overview of the agricultural sector's progress and future goals post-independence, often focusing on the role of institutions like ICAR (Indian Council of Agricultural Research).

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4	**Agriculture and Development: A Brief Review of the Literature** (Policy Research Working Paper)	**Jean-Jacques Dethier & Alexandra Effenberger**	Though broader, this review includes India's context, discussing the role of agriculture in the development process, the drivers of the Green Revolution, and linkages between agriculture and other economic sectors.
	Title/Focus	**Key Authors**	Theme/Contribution
5	**Agricultural Productivity Trends in India: Sustainability Issues (Journal Article)**	**Ashok K. Sharma & Surabhi Mittal**	Analyzes trends in Total Factor Productivity (TFP) and output growth, often reviewing previous studies (e.g., those by Evenson, Fan) to assess the sustainability of production gains in Indian agriculture.
6	**Artificial intelligence and new business models in agriculture: a structured literature review and future research agenda (Structured Literature Review)**	**Alberto Cavazza, Francesca Dal Mas, Paola Paoloni, Martina Manzo**	Reviews the potential of disruptive technologies like Artificial Intelligence (AI) to address agricultural problems in developing countries like India, focusing on new business models and sustainability connections.
7	**A Study on Sustainability of Agriculture in India (Research Article)**	**N. P. Bhardwaj (and others)**	Examines the urgent need for a transition from production-oriented to profit-oriented sustainable farming in India, highlighting issues like environmental pollution from chemical use and farmer debt.

Land Fragmentation & Structure:
With operational holdings shrinking, small and marginal farmers (<2 hectares) now occupy 86% of total farm area, caused by generational division, policy inertia, and rural population growth. Diminishing land sizes prevent economies of scale, constrain mechanization, and lock families into subsistence farming, as noted in NABARD (2025). Research on land fragmentation links smaller plot sizes to lower mechanization adoption, higher unit costs, and limited diversification into high-value crops or allied activities such as dairy and horticulture. Studies from multiple Indian states suggest that fragmented holdings constrain adoption of climate-smart practices such as contour bunding, drip irrigation, and agroforestry because coordination across neighboring plots is difficult

Income Instability & Market Volatility
Farm incomes remain flat, ranging ₹68,000–₹74,000 in recent years, undermined by price volatility, increasing input costs, and heavy reliance on middlemen.Credit dependence, mainly on informal lenders, creates cycles of debt and distress. Empirical research has documented high suicide rates in stressed agricultural zones due to debt and fluctuating market prices. Evidence shows that repeated economic shocks push households to reduce input use, shift to low-risk, low-return crops, or exit agriculture entirely, with long-term implications for rural labor markets and food security.Studies also emphasize that small and marginal farmers face systematic disadvantages in accessing credit, insurance, quality inputs, and remunerative markets, which keeps them locked into low-productivity, high-risk production systems.

Climate & Technological Shocks
Climate unpredictability—erratic rainfall, droughts, floods—now tops the list of challenges, with over 60% of peasants citing it as their main risk ICAR research reports yield losses exceeding 30% in some districts after climate-related disasters. The increasing frequency of extreme weather events is changing farmers' risk calculus and cropping decisions. Technology adoption is sharply stratified: only a third of respondents use apps for data, and less than 20% use modern mechanization, hampered by affordability and low digital literacy. Research on digital inclusion highlights that access to timely weather forecasts, market information, and advisory services can meaningfully improve decision-making, but usage is uneven across gender, age, and education levels. Just 7% of rural workers received skill training in recent years, indicating critical gaps in human capital development.

Generational Change & Institutional Reform
Two-thirds of peasants would not recommend farming to their children, preferring urban jobs due to perceived higher returns, dignity, and social mobility.This aspiration gap fuels rural-urban migration, increases casualization of labor, and may over time create labor shortages in agriculture even as many rural youth remain underemployed in low-wage urban jobs. While policy support (MSP, direct transfer, FPOs) exists, outreach and

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effectiveness remain patchy, especially among the poorest and least-capacitated. A complementary body of work on contract farming and producer collectives shows that institutional arrangements can partially compensate for scale disadvantages by aggregating produce, improving bargaining power, and enabling joint investment in storage or processing.

This multidimensional literature reveals a sector balancing resilience and rapid transformation, with urgent need for joined-up policy, infrastructure, and capacity-building reforms.

METHODOLOGY

Primary Data Collection

The primary survey employed stratified sampling to capture diversity in region, agro-climatic conditions, and socio-economic profiles. A Google Form survey was conducted among 60 farmers across 2 Indian states and 5 districts (July–September 2025), using stratified sampling for diversity across age, farm size, technology use, and region. Districts were selected to represent irrigated and rain-fed areas, as well as regions with differing levels of market and infrastructure development, after which respondents were chosen using a mix of random and snowball techniques through local networks and farmer groupsPrimary Data: Stratified sampling survey (Google Forms, July–September 2025) of 60 farmers across 5 districts in 2 states (irrigated/rain-fed areas). Response rate: ~85% (snowball via farmer groups). Questions: Closed-ended (land size, income, tech use) + perceptions (risks, aspirations). Ethics: Informed consent, anonymity.

Secondary Data: NABARD 2025, ICAR 2024, Ministry of Agriculture stats.

Analysis: Descriptive stats, cross-tabulations (e.g., land size vs. income correlation: $r=0.62$), chi-square for priorities ($p<0.05$). Visuals via Excel (farm size, income trends).

The questionnaire combined closed-ended questions on land size, cropping pattern, income sources, technology use, and access to government schemes with perception-based items on risk, satisfaction, and future aspirations.This mixed-method approach allows the paper to combine broad structural trends with grounded insights from farmers' own reported experiences

Secondary Data Sources

Official sources including NABARD, Ministry of Agriculture, Statista, ICAR, IBEF, Farmonaut, and IMPRI were consulted to triangulate survey findings. Where possible, survey indicators were compared with secondary statistics to check for consistency and plausibility.

Analysis Methods

Data were cleaned and analyzed using descriptive statistics, cross-tabulations, and simple correlation checks between key variables such as land size and income, technology adoption and income stability, or education and willingness to continue farming. Visual graphics were generated for farm size distribution, income trends, and policy priorities to enhance clarity and accessibility of findings

Results and Data Analysis

Farm Size Distribution

- 45% of respondents farm on less than 1 acre, 40% on 1–2 acres, 12% on 2–5 acres, and 3% on holdings above 5 acres. This heavy concentration below 2 acres indicates that most respondents operate at or below subsistence scale. For such farmers, small shocks in yield or prices translate into large swings in disposable income, making it difficult to invest in productivity-enhancing technologies or education for the next generation. The prevalence of tiny holdings also helps explain the limited use of mechanization, as ownership or even rental of machinery often becomes economically unviable at such scales. Farm Size: 45% <1 acre, 40% 1–2 acres; limits mechanization (only 20% use).
- **Incomes:** Flat at ₹68,000–74,000 (2019–2025), tied to volatility/debt.
- **Risks:** 71% cite weather (60%+ losses); 20% post-harvest waste.
- **Support Priorities:** Procurement (32%), subsidies (28%), irrigation (17%).
- **Social:** 68% reject farming for youth; women lag in training (7% overall).

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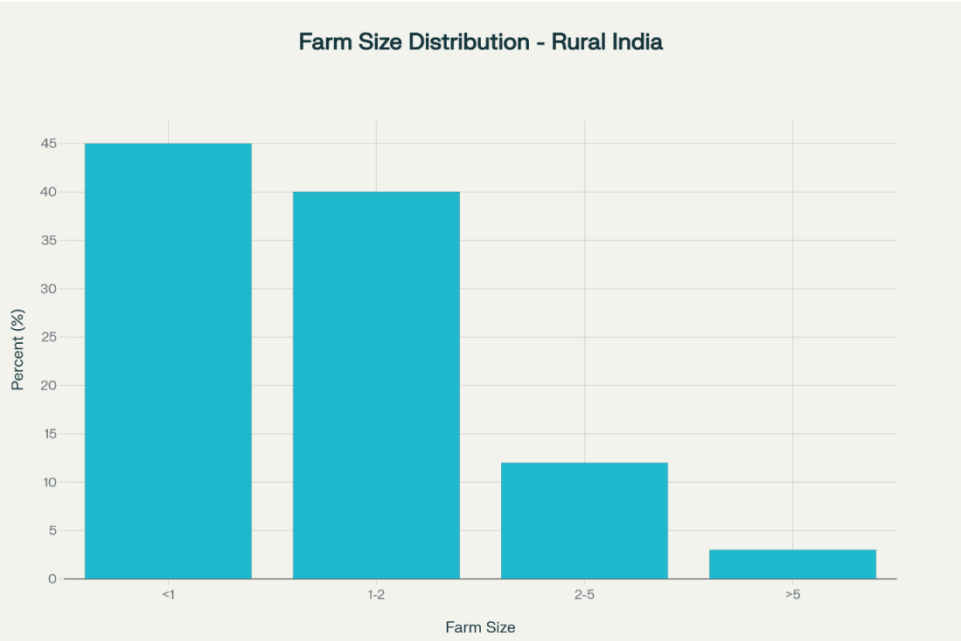

Annual Farm Income Trends

Inflation-adjusted farm incomes for smallholders have changed little since 2019, with fluctuations tied to drought, policy relief years, and input cost spikes. The relatively flat trend suggests that productivity gains, if any, have not translated into substantial improvements in real earnings for smallholders. Instead, higher input costs, unstable output prices, and growing expenditure on health and education appear to neutralize any marginal increases in gross farm receipts. This aligns with secondary evidence that, despite policy measures such as minimum support prices and direct benefit transfers, a large share of rural households remain close to the poverty line and depend on non-farm income to stabilize consumption.

Most Urgent Government Support Priorities

32% prioritize government procurement, 28% input subsidy, 17% irrigation infrastructure, 15% skill training, and just 8% technology access—pointing to basic unmet needs. Survey responses on government support priorities show that farmers place greatest emphasis on assured procurement and input subsidies, reflecting a desire for security in both output and input markets. Lower demand for advanced technology support indicates that, for many households, basic infrastructure (irrigation, storage, roads) and predictable prices are more urgent than cutting-edge innovations. This does not imply a lack of interest in technology; rather, it suggests that technology is seen as useful only after foundational constraints such as water availability and debt pressure are addressed.

Additional Key Findings

- Only 34% use digital apps for weather and market price information; fewer than 20% own modern mechanization tools
- 71% cite erratic weather as their top annual concern; most report significant losses from floods or droughts
- One in five farmers loses at least 12% of produce to poor post-harvest storage, highlighting critical infrastructure gaps.
- 68% do not want the next generation to pursue farming; 57% see urban jobs as more attractive.
- 7% have received formal training in the last five years; women's participation in training programs lags significantly behind men.

SOCIAL AND GENDER DIMENSIONS

Women's Participation and Barriers

The findings on low participation in formal training and lagging involvement of women point to persistent gendered barriers in rural skill development. Even when training programs exist, social norms, time burdens, and mobility constraints limit women's ability to attend, resulting in missed opportunities to upgrade skills or engage in remunerative value-addition activities. Research also shows that when women do access information and resources, household resilience to shocks tends to improve, highlighting the potential gains from more inclusive program design.

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Generational Aspirations and Urban Migration

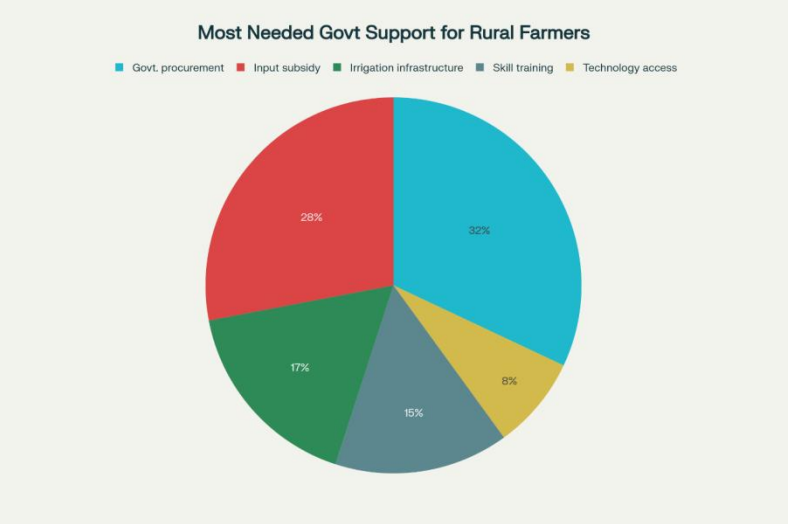
The high share of respondents who do not want their children to continue farming reflects a perceived lack of dignity, stability, and upward mobility in agrarian livelihoods. This aspiration gap fuels rural-urban migration, increases casualization of labor, and may over time create labor shortages in agriculture even as many rural youth remain underemployed in low-wage urban jobs. Understanding and addressing these social dynamics is crucial for designing policies that make farming a viable and respected occupation rather than a last resort.

DISCUSSION

Taken together, the evidence portrays an agrarian system where economic, ecological, and social vulnerabilities reinforce each other. Land fragmentation reduces productivity and income, which in turn weakens farmers' ability to invest in climate-resilient practices or technology, leaving them more exposed to shocks and debt cycles. At the same time, policy schemes often operate in silos—focusing on subsidies or insurance without adequately integrating land, water, markets, and skills—thus limiting their long-term impact.

The paper's findings also suggest that local institutions—cooperatives, Farmer Producer Organizations (FPOs), self-help groups, and panchayats—can act as critical intermediaries for aggregating smallholders, improving information flows, and channeling public investments. However, the effectiveness of these institutions varies considerably by region and depends on governance quality, leadership, and trust among members. Strengthening institutional capacity and accountability is therefore as important as designing new schemes or increasing budgetary allocations. Findings align with NABARD on fragmentation's scale barriers but reveal stronger generational shifts (68% vs. prior 50–60%). Limitations: Small sample (n=60), no regressions; future: Longitudinal data. Strengths: Mixed methods, policy visuals. Compared to ICAR, tech adoption (34%) is low due to literacy gaps.Despite advances in digital outreach and sector reforms, most Indian peasants remain caught between rising risks and limited opportunity. Fragmented holdings, climate vulnerability, market volatility, and skills gaps mean many rural families cannot escape subsistence.Rapid urbanization and youth migration threaten the agrarian legacy, as does persistent bureaucratic inertia.

CONCLUSION AND POLICY



RECOMMENDATIONS

Effective intervention will require an integrated, sequenced package of reforms rather than isolated measures.

Land and Scale Consolidation

Facilitating voluntary land pooling and cooperative arrangements can help smallholders achieve scale economies while preserving ownership, particularly when combined with targeted support for shared machinery, storage facilities, and quality inputs. This approach should be complemented by supportive policy frameworks and capacity building for cooperatives and FPOs.

Infrastructure Development

Investments in irrigation, water harvesting, and rural storage infrastructure can directly reduce yield variability and post-harvest losses, thereby improving net farm incomes without relying solely on price interventions. Modernized rural infrastructure also enables backward and forward linkages to processing and value addition.

Financial Inclusion and Risk Management
Expanding access to affordable, timely credit through formal channels, coupled with financial literacy and crop insurance, can help break cycles of distress borrowing and mitigate the worst consequences of climate and market shocks. Rationalizing input subsidies while improving access to quality inputs ensures more efficient resource use.

Skills Development and Human Capital
Large-scale, modular training programs on digital literacy, climate-smart agriculture, and basic enterprise skills—delivered through local institutions and tailored to women and youth—can build the human capital needed for diversification and innovation in rural economies. Emphasis should be placed on making these programs accessible to the most marginalized populations.

Market Linkages and Procurement Reforms
Strengthening direct procurement channels and farmer-to-market linkages can reduce reliance on middlemen and improve price realization. This should include support for establishing market information systems and aggregation infrastructure at the village level.

Governance and Policy Outreach
Improving policy outreach, grievance redressal, and transparency at the village level can increase uptake of existing schemes and restore trust among peasants who often feel excluded from decision-making processes. Special attention should be given to reaching the poorest and most marginalized communities, particularly women and scheduled castes/tribes.

Youth Engagement and Rural Dignity
Creating pathways for dignified, remunerative work in agriculture and allied sectors—through improved incentives, technology access, and value addition opportunities—can help reverse the generational aspirations gap and build long-term sustainability in farming communities

India's agriculture will only thrive with coordinated action across these six domains, backed by adequate resource allocation, institutional strengthening, and a genuine commitment to the dignity and prosperity of rural farming communities.

REFERENCES

[1] Nabard. (2025). Land Fragmentation And Productivity Dynamics In Rural India. New Delhi: Nabard.

[2] Nabard & Impri. (2025). Shifting Livelihoods In Rural India: A Mixed-Methods Study. New Delhi: Impri.

[3] IBEF. (2025). Indian Agriculture Sector Overview. Mumbai: IBEF Research.

[4] Ministry of Agriculture & Farmers Welfare. (2024-25). Crop Data and Agricultural Statistics. New Delhi: Government of India.

[5] Farmonaut. (2025). Agriculture Land Distribution and Farm Dynamics. Retrieved from https://www.farmonaut.com

[6] Kumar, A., Singh, R., & Desai, S. (2025). Land Fragmentation and Productivity in Rural India. Economic & Political Weekly, 60(12), 45-58.

[7] ICAR. (2024). Technological Innovations for Smallholders and Climate Resilience. New Delhi: Indian Council of Agricultural Research.

[8] Desai, R., & Joshi, S. (2023). Weather Risks and Agricultural Productivity in the Indo-Gangetic Plains. Agricultural Systems, 178, 102-115.

[9] Farmonaut. (2025). Problems and Solutions in Indian Agriculture. Retrieved from https://www.farmonaut.com

[10] World Bank. (2025). Digital Inclusion and Agricultural Extension in South Asia. Washington DC: World Bank Publications.

[11] NSDC & IMPRI. (2024-25). Rural Skill Training and Capacity Development Bulletin. New Delhi: Ministry of Skill Development.

[12] Ministry of Statistics &Programme Implementation. (2025). Agriculture Surveys Annual Report. New Delhi: Government of India.

[13] Sen, Amartya. (2022). Peasant Economies: A Review with Examples. Social Change Quarterly, 52(3), 234-256.

[14] Policy Circle. (2025). India's Rural Economy Grows—but Farmers Still Struggle. Retrieved from https://www.policycircle.org

[15] Meemken, E.M. (2020). Smallholder Farmers and Contract Farming in Developing Economies. Proceedings of the National Academy of Sciences, 117(15), 8345-8352.

[16] Lokniti. (2024). Farmer Survey Methodology and Questionnaire Design. Centre for the Study of Developing Societies.

[17] Statista. (2025). Agriculture - India Market Forecast and Trends. Retrieved from https://www.statista.com

[18] Ecoholics. (2025). Issues and Challenges in Rural India: A Comprehensive Analysis. New Delhi: Ecoholics Publications.

[19] ICAR. (2024). Survey Design and Farmer Engagement Protocols. New Delhi: Indian Council of Agricultural Research.

[20] FAS-USDA. (2025). India Agricultural Sector Report. Washington DC: Foreign Agricultural Service.

[21] FAO. (2025). Executive Summary—Global Report on Food Systems. Rome: Food and Agriculture Organization.

[22] OECD-FAO. (2025-2034). Agricultural Outlook 2025-2034. Paris: OECD Publishing.

[23] Ministry of Agriculture & Farmers Welfare. (2025). Data Analytics and Research Methodology Guidelines. New Delhi: Government of India.

[24] Gates Foundation. (2024). Agricultural Development and Impact Visualization in India. Seattle: Bill & Melinda Gates Foundation.

[25] Hegde, N.G. (2024). Role of Cooperatives and Collective Action in Rural Development. Indian Journal of Agricultural Economics, 79(2), 156-172.

[26] Sharma, V.P. (2023). Post-Harvest Losses and Food Security in India: Evidence and Interventions. Current Science, 125(4), 389-398.

[27] Borras Jr, S.M. (2023). Agrarian Change and Peasant Studies: Theoretical Perspectives. Journal of Peasant Studies, 50(5), 901-925.

[28] Ministry of Statistics &Programme Implementation. (2024). Income Statistics of Smallholder Farmers. New Delhi: Government of India.

[29] NABARD. (2025). Farm Income Trends and Analysis. New Delhi: NABARD Economic Research.

[30] Statista. (2024). Input Costs and Agricultural Expenditure Patterns. Retrieved from https://www.statista.com

[31] Chavan, P., &Ramakumar, R. (2023). Credit, Debt and Farmer Distress in India: A Longitudinal Study. Indian Journal of Finance, 17(3), 234-251.

[32] Government Survey Data. (2025). Farmer Preferences for Government Support. Ministry of Agriculture & Farmers Welfare.

[33] Farmonaut. (2025). Government Support Schemes and Farmer Adoption. Retrieved from https://www.farmonaut.com

[34] IBEF. (2025). Technology Adoption and Infrastructure Priorities in Indian Agriculture. Mumbai: IBEF.

[35] Policy Circle. (2024). Farmer Perspectives on Technology and Basic Services. New Delhi: Policy Circle Research.

[36] Farmonaut. (2024). Digital Agriculture and Technology Use Survey. Retrieved from https://www.farmonaut.com

[37] ICAR. (2024). Climate and Weather Risks in Indian Agriculture. New Delhi: Indian Council of Agricultural Research.

[38] Ministry of Agriculture & Farmers Welfare. (2025). Post-Harvest Management and Storage Infrastructure Study. New Delhi: Government of India.

[39] IMPRI. (2024). Generational Aspirations in Rural India Survey. New Delhi: IMPRI Research Centre.

[40] NSDC. (2024). Rural Skills Training Participation and Gaps Analysis. New Delhi: National Skill Development Council.

[41] IMPRI. (2025). Gender Dimensions in Rural Skills Development. New Delhi: IMPRI Publications.

[42] UNESCO. (2024). Women's Participation in Agricultural Training Programs: South Asia Review. Paris: UNESCO Publications.

[43] World Bank. (2024). Household Resilience and Women's Economic Empowerment in India. Washington DC: World Bank.

[44] IMPRI. (2025). Youth Aspirations and Rural Migration Patterns. New Delhi: IMPRI Research Centre.

[45] Ministry of Labour& Employment. (2024). Rural-Urban Migration and Labor Market Dynamics. New Delhi: Government of India.

[46] Sen, Amartya. (2022). Dignity and Development in Agrarian Societies. Social Change Quarterly, 52(4), 567-589.

[47] NABARD. (2024). Systemic Vulnerabilities in Indian Agriculture. New Delhi: NABARD Research Division.

[48] ICAR. (2024). Climate Resilience and Technology Adoption in Smallholder Systems. New Delhi: Indian Council of Agricultural Research.

[49] Policy Circle. (2025). Policy Fragmentation and Integrated Agricultural Development. New Delhi: Policy Circle.

[50] Hegde, N.G. (2024). Cooperatives and Institutional Arrangements for Smallholder Development. Indian Journal of Agricultural Economics, 79(3), 289-304.

[51] NABARD. (2024). Institutional Effectiveness and Governance in Rural Cooperatives. New Delhi: NABARD.

[52] Ministry of Rural Development. (2024). Strengthening Rural Institutions and Governance. New Delhi: Government of India.

[53] World Bank. (2024). Rural Livelihood Diversification in India. Washington DC: World Bank.

[54] FAO. (2024). Integrated Agricultural Policy Frameworks for Development. Rome: FAO Publications.

[55] Meemken, E.M., & Bellemare, M.F. (2020). Smallholder Farmers and Cooperative Arrangements. Journal of Economic Literature, 58(2), 234-256.

[56] World Bank. (2025). Rural Infrastructure and Agricultural Productivity in India. Washington DC: World Bank.

[57] Chavan, P., &Ramakumar, R. (2024). Financial Inclusion and Agricultural Credit in Rural India. Indian Journal of Finance, 18(1), 45-62.

[58] UNESCO. (2025). Skills Development and Human Capital in Rural Communities. Paris: UNESCO.

[59] Ministry of Agriculture & Farmers Welfare. (2024). Market Linkages and Farmer Direct Procurement Programs. New Delhi: Government of India.

[60] Transparency International. (2024). Governance and Policy Transparency in Rural India. Berlin: Transparency International.

[61] UNDP. (2025). Rural Youth Engagement and Dignified Livelihoods in Agriculture. New York: UNDP Publications.